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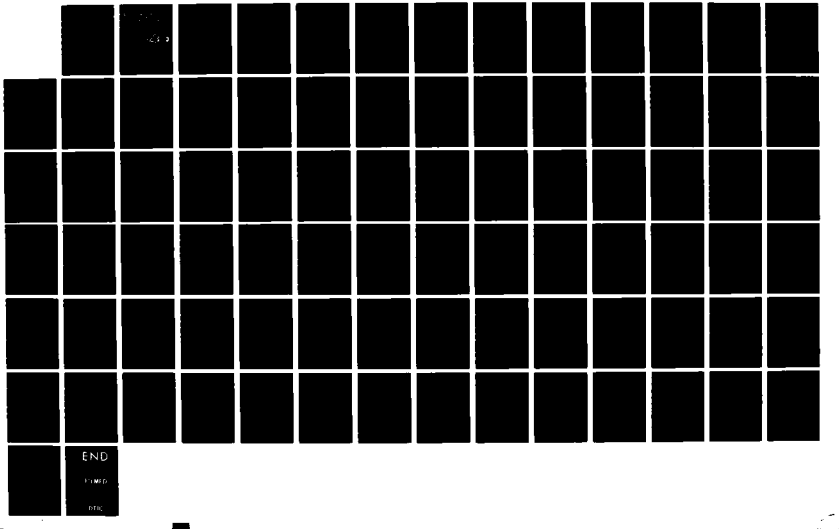

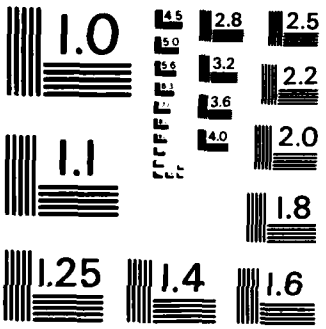

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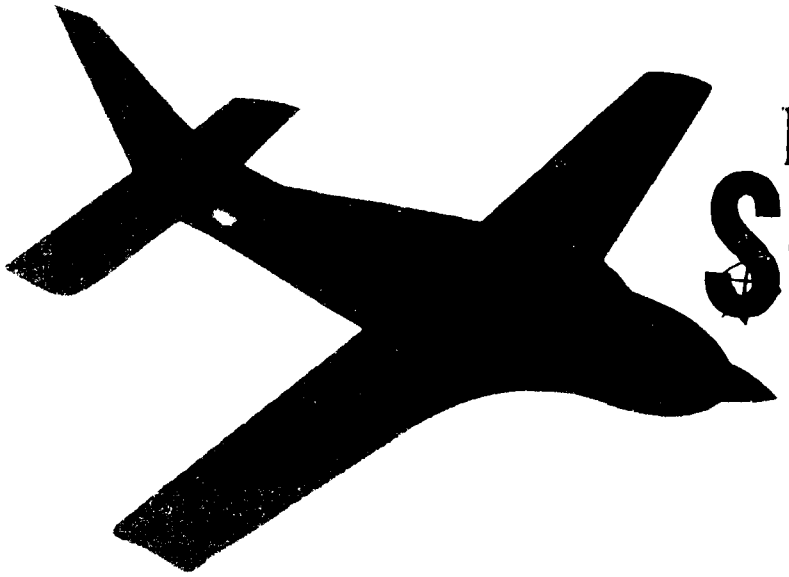
U.S. Department of Transportation
Federal Aviation Administration

General Aviation Pilot and Aircraft Activity Survey



Office of Management Systems
Management Standards and
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Washington DC 20591

September 1985

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16. Abstract

This report provides a summary and analysis of the data collected in the 1984 General Aviation Pilot and Aircraft Activity Survey. The survey was conducted at a random sample of general aviation airports across the nation throughout the months of July, August, September, and October, 1984 by the Federal Aviation Administration with the assistance of the Civil Air Patrol.

The survey data provide information regarding the magnitude and characteristics of general aviation including: type and source of weather information services, trip length in time and distance, and pilot age and certification. Estimates are made of total 1984 general aviation operations, fuel consumption and aircraft miles flown.

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PREFACE

This report presents the results of the 1984 General Aviation Pilot and Aircraft Activity Survey. This survey represents one component of the Federal Aviation Administration's (FAA) efforts to investigate, measure and document the characteristics and impacts of general aviation. This survey was sponsored by FAA's Office of Management Systems, Information and Statistics Division. Survey design, sample design, preparation of survey materials and implementation was performed by the Transportation Systems Center (TSC), Transportation Statistical Analysis Division and their contractors.

Although the survey was conducted under the auspices of the FAA, the data collection was made possible through the efforts of the Civil Air Patrol (CAP). The Federal Aviation Administration appreciates the time and efforts of Brigadier General David L. Patton, USAF, Executive Director of CAP, and the CAP Wing Commanders of all 50 states and Puerto Rico, who coordinated the survey operations, and thousands of CAP squadron commanders, officers and cadets who performed the on-site data collection nationwide. Shung-Chai Huang of the FAA, under the guidance of Nicholas L. Soldo, Manager of the Statistical Analysis Branch, Management Standards and Statistics Division, provided valuable assistance in coordinating with the CAP and in sharing his experience from past surveys.

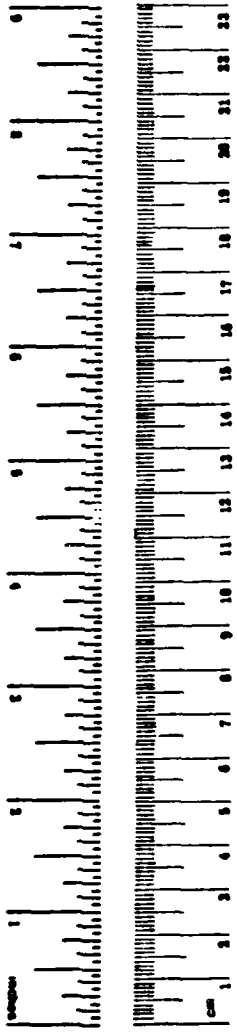
Distribution: ZMS-348F; ZMS-411; FFS-1, 7 (MINIMUM); CAP

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

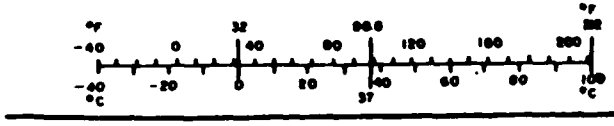
Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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EXECUTIVE SUMMARY

This report presents the results of the 1984 General Aviation Pilot and Aircraft Activity Survey. The survey was conducted by the Federal Aviation Administration (FAA) with the assistance of the Civil Air Patrol (CAP). The purpose of the survey is to acquire current information about general aviation characteristics, including pilot profiles, flight profiles, airport facilities, use of weather information, fuel consumption, aircraft miles flown and traffic volume and patterns.

The survey was conducted at 201 public-use airports. The sample represents a cross-section of airport types and is representative of the FAA regions. Two survey documents were used, a Pilot Questionnaire form and a Traffic Count form. Incoming pilots were interviewed and all general aviation operations were recorded on each of two pre-selected dates (one weekday and one weekend day) during the months of July, August, September and October, 1984. The survey was the fifth in a series of general aviation surveys conducted at 3 year intervals by the FAA in association with the CAP.

One of the major objectives of the survey was to develop a general aviation pilot profile. Pilot characteristics such as age, certification, current instrument rating, aircraft ownership, purpose of flight, and utilization of flight plans formed the basis of the survey. Data from the 1984 survey were compared to data obtained from the 1981, 1978 and 1975 surveys.

- The greatest percentage of pilots interviewed held private certificates, followed by commercial certificates and ATR certificates, respectively.

- The aggregate surveys portray an apparent aging of the active pilot population, with the sample nearly approximating the active pilot population.

- The number of average hours flown since 1983 was greater than in 1980 for all pilot certificate categories except ATR. In general, pilots logged more cross-country flight hours than local flight hours, except for student pilots whose flying was mostly local.

- The tendency among pilots making longer flights to file flight plans is reflected in the data in 1984, with more than 90 percent of pilots making local flights failing to file flight plans, and with only 45 percent of cross-country pilots not filing. For flying under IFR where a flight plan is required, the percentages of pilots filing rose as compared to 1981.

The second objective of the 1984 survey was to develop flight profiles by aircraft type. Several characteristics such as flight time, purpose of trip and load factor were considered. It was

found that the distribution of types of aircraft among the surveyed and active aircraft population remained fairly constant over the survey periods. A shift in types of flights became apparent from 1981 to 1984, with nearly two-thirds of the general aviation operations surveyed in 1984 being cross-country, compared to less than 55 percent in the earlier surveys.

- The average load factor and average trip distance decreased for both local and cross-country flights for most types of aircraft.

- Flight characteristics varied with the purpose of the trip. Aerial application and industrial local flights averaged the greatest flight times. Business and executive/corporate cross-country flights averaged the longest distance.

A significant portion of the pilot survey was devoted to the extent of use of preflight and inflight weather information. Preflight and inflight weather information are available to pilots from the FAA and other sources. The survey results portray the extent to which FAA and other sources were utilized according to type and purpose of flight as well as the utilization of weather information by category of pilot certificate and type of aircraft.

- The survey results indicated that the use of FAA preflight weather information by pilots was unchanged from 1981 to 1984, while the use of other sources of weather information rose appreciably. In 1981, approximately 50 percent of pilots making local flights obtained no preflight weather information, whereas in 1984 only 35 percent failed to use weather information sources prior to making local flights.

- Commuter air carrier pilots reduced their use of FAA preflight weather information for cross-country flights from 90.3 percent in 1981 to 50.7 percent in 1984.

- The statistics for inflight weather information show that the number of pilots using FAA inflight weather information for local flights declined by 6 percent from 1981 to 1984 and by 2 percent for cross-country flights.

- Inflight weather information was less in demand, with neither category using it as frequently as in 1981. Pilots making local flights failed to obtain inflight information nearly 69 percent of the time and nearly 47 percent of pilots making cross-country flights did not request weather information once in the air.

Another objective of the data analysis was to estimate total fuel consumption and average miles flown in general aviation. 1983 fuel consumption was calculated by multiplying total hours flown by the average amount of fuel consumed for each aircraft type. Miles

flown were calculated by using a combination of survey data and data obtained from the FAA General Aviation Activity and Avionics Survey of 1983.

- o General aviation flying in 1983 was estimated to have consumed 388.0 million gallons of aviation gasoline and 552.5 million gallons of jet fuel. This is a decrease of 14.0 percent in aviation gasoline consumption and an increase of 10.4 percent in jet fuel consumption in comparison with 1981.

- o Although total miles flown decreased slightly from 1981 to 1983, local flight miles showed a marked decline of 544 million miles and cross-country flight miles rose dramatically by 406 million miles.

One of the major objectives of the survey was the estimation of the total number of general aviation operations (take-offs or landings) occurring in 1984. Traffic count form data were used to derive estimates of daily operations for each of four airport types (towered; non-towered, paved and lighted; non-towered, paved and unlighted; and non-towered and unpaved).

- o The average number of daily operations for towered airports was 283 while the average for non-towered airports was 58. The estimate of total general aviation operations at public use airports amounted to 164.1 million.

The survey asked the pilots for their opinions as to levels of airport facilities provided. The survey was conducted at public-use general aviation airports with a variety of services available at each specific one.

- o The surveyed pilots replied that most of these requirements were met very well at the survey site airport.

- o The facilities most preferred at a destination airport were runway lighting and FBO service.

I. INTRODUCTION

A. BACKGROUND

The 1984 General Aviation Pilot and Aircraft Activity Survey was conducted by the Federal Aviation Administration (FAA) with the assistance of the Civil Air Patrol (CAP). The major purpose of this survey was to collect current information on the characteristics of general aviation pilots and flights.

The present survey is the fifth in a series of surveys conducted triennially. The first survey in this sequence was conducted in 1972, and was limited in scope to an examination of pilot and aircraft characteristics. The objectives of the 1975, 1978 and 1981 surveys were expanded to include an examination of all general aviation activities occurring at the selected airports. The 1984 survey is modeled after these preceding surveys. Several additional questions were added to obtain pilots' opinions about current and desired airport facilities.

The data collected in this survey are unique as no other data collection activity collects information from the on-site pilot. Also, this survey is the only data collection effort which attempts to measure the extent of general aviation aircraft operations at non-towered airports on a national level.

B. OBJECTIVES

The specific objectives of the 1984 survey were to develop pilot and flight profiles, investigate pilot opinion about airport facilities, measure the utilization of FAA weather services, estimate general aviation fuel consumption and miles flown, identify patterns in general aviation traffic and to identify any changes in general aviation activity by comparison with the results from the surveys from previous years.

The pilot profiles include characteristics such as age, type of pilot certificate, instrument rating, hours flown in 1983 and utilization of flight plans. The flight profiles include characteristics such as source of aircraft, purpose of trip, load factor, trip time, distance and speed, and local versus cross-country distinctions.

To accomplish these objectives, information was collected on the population of active general aviation pilots in 1984, the population of general aviation flights in 1984 and the population of general aviation operations occurring in 1984.

During the months of July, August, September and October 1984, 3361 incoming pilots were interviewed at 196 randomly selected airports in 46 states. The response rate among the pilots was

approximately 82 percent. General aviation operations were derived from Traffic Count forms received from 201 airports out of a sample size of 445. The results of the survey are based on an analysis of the responses of these pilots and airports.

C. ANALYSIS

The data were analyzed to provide pilot profiles, flight profiles, airport facility preferences, and estimates of general aviation operations and traffic patterns in 1984. Comparisons of the data in this survey and the 1978 and 1981 surveys were made to determine if any major changes in pilot or flight characteristics occurred over time.

Apart from a general descriptive analysis of the data, several issues were considered in developing the pilot and flight profiles. These included analyzing the extent of use of FAA services and facilities for obtaining weather information, the extent of filing flight plans by pilots, and estimates of fuel consumption and total miles flown by the entire general aviation population.

The data in the Traffic Count forms were used to derive estimates of the annual general aviation operations for each of the four types of airports included in the study:

Type 1. Towered

Type 2. Non-towered, paved and lighted (with at least one paved runway)

Type 3. Non-towered, paved and unlighted (with at least one paved runway)

Type 4. Non-towered, unpaved

The data were adjusted to account for seasonal bias in the data collection.

Chapter II presents the survey results and is divided into six major sections:

Section A. Pilot Profiles

Section B. Flight Profiles

Section C. Utilization of Services Providing Weather Information both Preflight and Inflight

Section D. Airport Facility Preferences

Section E. Estimates of Fuel Consumption and Aircraft Miles Flown

Section F. Estimates of Total 1984 General Aviation Operations and Traffic Patterns between Airport Types

Chapter III contains the details of the sampling plan and the statistical methodologies employed during this study. Appendix A includes additional, more detailed tables. Appendix B contains copies of the survey forms.

II. SURVEY RESULTS

A. PILOT PROFILES

One of the major objectives of the survey is to develop a profile of the 1984 population of active general aviation pilots. This has been achieved by generating frequency distributions of data obtained from the Pilot Questionnaire forms on such characteristics as age, certification, current instrument rating, aircraft ownership, purpose of flight and utilization of flight plans. In addition, cross-tabulations were used to determine relationships among these variables.

Table 1 presents a comparison between the distribution of surveyed pilots and the active pilot population as of December 1984 according to the type of certificate held. According to the Airmen Certification records maintained by the FAA, active airmen are those who hold both an airman certificate and a valid medical certificate. The table indicates that the greatest percentage of pilots interviewed held private certificates. The percentage of pilots holding private certificates among the surveyed sample (43.4 percent) was almost the same as the percentage holding private certificates among the active pilot population (44.3 percent). The second largest portion of pilots interviewed held commercial certificates. This percentage (30.6 percent) was noticeably higher than the percentage of pilots holding commercial certificates in the active pilot population (21.6 percent). Pilots holding student certificates were underrepresented in the sample (12.0 percent), in comparison to the number of student certificates held in the active pilot population (20.8 percent).

A comparison of the 1984 data with the results of the 1981, 1978 and 1975 surveys shows that there have been no noticeable changes in the sample distribution of pilot certificate categories. The overrepresentation of pilots with commercial certificates and the underrepresentation of pilots with student certificates has remained at similar levels.

Table 1 also presents the percentage distribution of aircraft ownership by pilot certificate. The table indicates that of pilots owning their own aircraft, over 40 percent (41.5 percent) held private certificates. This is a major drop from the 1981 survey where nearly 60 percent (59.6 percent) of pilots owning their own airplanes held private certificates.

Table 2 presents the age distribution of the sampled pilots and in the active pilot population in 1984. These data show great similarity between the two distributions. The youngest group of pilots, those under the age of 19, were slightly underrepresented in the sample (1.8 percent) in comparison to the active pilot population (2.5 percent).

TABLE 1

PERCENTAGE DISTRIBUTIONS OF ACTIVE PILOT POPULATION, PILOT INTERVIEWS, AND AIRCRAFT OWNERSHIP BY PILOT CERTIFICATE

PILOT CERTIFICATE	ACTIVE PILOT 1 POPULATION	PILOT INTERVIEWS	PRIVATE AIRCRAFT OWNERSHIP
STUDENT	20.8	12.2	4.3
PRIVATE	44.3	43.5	41.5
COMMERCIAL	21.6	30.7	37.1
ATR	11.0	13.3	15.5
FOREIGN	N/A	0.3	0.4
OTHER	2.3	0.0	0.0
TOTAL	100.0	100.0	100.0

1"1984 U.S. Civil Airmen Statistics," U.S. Department of Transportation, Federal Aviation Administration (Washington, D.C., 1985), p. 4.

TABLE 2

PERCENTAGE DISTRIBUTION OF ACTIVE PILOT POPULATION AND PILOT INTERVIEWS BY PILOT AGE

PILOT AGE	ACTIVE PILOT POPULATION [1]	PILOT INTERVIEWS
UNDER 16	0.0	0.2
16-19	2.5	1.6
20-24	9.1	8.6
25-29	13.2	12.0
30-34	14.5	13.5
35-40	15.3	14.7
40-44	12.9	13.8
45-49	10.0	10.2
50-54	8.5	10.8
55-59	6.6	6.8
60 AND OVER	7.4	7.8
TOTAL	100.0	100.0

1 "1984 U.S. Civil Airmen Statistics," U.S. Department of Transportation, Federal Aviation Administration (Washington, D.C., 1985), p. 20.

A comparison among the age distribution of sampled pilots in the 1975, 1978, 1981 and 1984 surveys portrays an apparent aging of the active pilot population. The percentage of active pilots over 60 years of age increased slightly over the decade. In the sample populations, the percentage of pilots over 60 years old have increased from 2.5 percent in 1975, to 3.0 percent in 1978, to 4.6 percent in 1981 and jumped to 7.8 percent in the current survey.

Table 3 presents the percentage distribution of current instrument ratings by pilot certificate. 99 percent of all ATR pilots surveyed held current instrument ratings; while only 34 percent of all pilots surveyed with private certificates held current instrument ratings.

In the examination of pilot characteristics, the relationships among such characteristics as age, pilot certificate, ownership of aircraft, and instrument rating were explored. The results of these analyses are presented in Tables A-1 through A-3, in Appendix A.

These analyses provide more insight into the personal characteristics of the sampled pilot population. Table A-1 presents information on the relationship between pilot age and pilot certificate. The data show that private certificates were the most common (43.4 percent). A greater percentage of pilots over 24 years of age held private certificates than held any other certificate.

A significant relationship was found to exist between pilot and reported ownership as shown in Table A-2. Pilots over 35 were more likely to own an airplane than to obtain it from another source.

The relationship between source of aircraft and pilot certificate was examined and is shown in Table A-3. Private ownership was reported by 63.5 percent of all pilots holding private certificates. Conversely, 74.8 percent of all pilots in the student category indicated their aircraft were rented, leased, or obtained from a flying club.

In addition to the personal characteristics of the pilots interviewed, their activities were examined as part of the pilot's profile. Pilots were requested to supply information about the number of hours flown during the previous year, both local and cross-country. A local flight is one that takes place within 20 miles of the airport. Cross-country flights are all those of more than 20 miles or those having different origin and destination airports.

The data are presented in Table 4 by pilot certificate. As expected, commercial and ATR pilots logged in the greatest number of hours flown in 1983. ATR pilots flew an average of 671.5 hours

TABLE 3

PERCENTAGE DISTRIBUTION OF CURRENT INSTRUMENT RATING BY PILOT CERTIFICATE

PILOT CERTIFICATE	CURRENT INSTRUMENT RATING	
	YES	NO
STUDENT	0.0	100.0
PRIVATE	34.0	66.0
COMMERCIAL	88.9	11.1
ATR	97.9	2.1
FOREIGN	85.3	14.7
ALL CERTIFICATES	70.1	29.9

TABLE 4

AVERAGE HOURS FLOWN IN CY 1983 BY PILOT CERTIFICATE - LOCAL VS. CROSS-COUNTRY

PILOT CERTIFICATE	TOTAL HOURS	AVERAGE HOURS FLOWN			
		LOCAL		CROSS-COUNTRY	
		HOURS	% TOTAL	HOURS	% TOTAL
STUDENT	75.7	60.4	79.8	15.3	20.2
PRIVATE	236.1	95.4	40.4	140.7	59.6
COMMERCIAL	612.7	262.0	42.8	350.7	57.2
ATR	671.5	136.8	20.4	534.7	79.6
FOREIGN[1]	717.0	20.8	2.9	696.2	97.1

[1]Extremely low representation in survey sample.

in 1983, nearly 80 percent were cross-country. Students were the only category of pilots to fly more local hours, averaging 60.4, than cross-country hours, averaging 15.3.

In comparison with the 1981 survey, the 1984 survey showed a greater number of average hours flown by students, private and commercial pilots. Students showed an increase from an average of 64 hours flown in 1980 to an average of 75.7 hours flown in 1983; the proportion of local hours increased from 61 percent in 1980 to 79.8 percent in 1983. Private pilots increased from an average of 158 hours in 1980 to an average of 236.1 hours in 1983; the proportions of cross-country and local hours remained fairly constant. Commercial pilots increased their average number of hours flown from 424 in 1980 to an average of 612.7 hours in 1983. In contrast, the average number of hours flown by ATR pilots decreased from 748 hours in 1980 to 671.5 hours in 1983; the largest portion of the decrease was shown in local hours flown, decreasing from 28 percent of the total in 1980 to 20.4 percent in 1983.

One objective of the survey was to determine the extent to which pilots filed flight plans. The purpose of a flight plan is to inform the FAA about the destination, direction, and route of a flight. This allows for monitoring available airspace and for initiating search procedures in the event of an overdue aircraft.

Two types of flight plans can be filed: Instrument Flight Rules (IFR) and Visual Flight Rules (VFR). In some instances, both IFR and VFR may be filed. The results showing utilization of flight plans for both local and cross-country flying are presented in Table 5 by type of pilot certificate.

As expected, the percentage of pilots who did not file a flight plan for local flights was very high, 92.2 percent. Of those pilots making a cross-country flight, 44.9 percent did not file a flight plan. The percentage for cross-country flights was lower as pilots have a greater tendency to file flight plans when making longer flights.

Nearly 40 percent (37.7) were flying cross-country under IFR, in which case a flight plan is required. Comparison with 1981 data show an increase in the percentages of pilots flying under IFR filing flight plans. For local flights the percentages increased from 1.5 percent in 1981 to 2.3 percent in 1984, while for cross-country flights the percentage rose from 19.2 percent in 1981 to 37.7 percent in 1984.

Table 6 presents the distribution of pilots who flew in 1983 according to pilot certificate. Almost 100 percent of all ATR pilots surveyed flew in the previous year, while only one quarter of the student pilots did.

TABLE 5

PERCENTAGE UTILIZATION OF FLIGHT PLAN
BY TYPE OF FLIGHT BY PILOT CERTIFICATE

LOCAL FLIGHT PLAN				PILOT CERTIFICATE	CROSS-COUNTRY FLIGHT PLAN			
NONE	IFR	VFR	COMP[1]		NONE	IFR	VFR	COMP[1]
93.0	1.0	5.1	0.8	STUDENT	26.2	2.4	71.2	0.2
93.7	1.8	4.2	0.3	PRIVATE	63.5	17.1	19.3	0.1
88.9	2.9	6.1	2.1	COMMERCIAL	45.3	36.1	17.7	0.8
90.6	2.0	7.5	0.0	ATR	32.0	58.0	10.0	0.0
100.0	0.0	0.0	0.0	FOREIGN[2]	8.0	24.0	68.0	0.0
91.1	2.3	5.5	1.0	ALL CERTIFICATES	44.5	37.7	17.4	0.4

[1]Composite: Use of both IFR and VFR Flight Plans.

[2]Extremely low representation in survey sample.

TABLE 6

PERCENTAGE DISTRIBUTION OF PILOTS
WHO FLEW IN 1983 BY PILOT CERTIFICATE

PILOT CERTIFICATE	FLEW IN 1983	DID NOT FLY 1983
STUDENT	24.8	75.2
PRIVATE	89.1	10.9
COMMERCIAL	98.4	1.6
ATR	99.6	0.4
FOREIGN	36.9	63.1
TOTAL	89.3	10.7

B. FLIGHT PROFILES

The second objective of the 1984 survey was to develop flight profiles by aircraft type. Several characteristics such as flight time, source of aircraft, purpose of trip, and load factor were examined.

Table 7 presents a comparison of the distribution of surveyed aircraft over the past three survey periods (1978, 1981 and 1984), along with the distribution of registered active aircraft for 1978, 1981, and 1983 by type of aircraft. The two sets of distributions were quite similar and each set appears to have remained fairly constant over time. The slight overrepresentation of turboprops and underrepresentation of rotorcraft may be a function of the airports in the sample which are primarily general aviation airports.

Tables 8 and 9 present various flight characteristics by aircraft type and type of flight: local and cross-country. In local flying, which usually is instructional, almost all types of aircraft performed three takeoffs and three landings per flight over the course of an hour. In most cases, there were two persons aboard the aircraft: probably a pilot-in-command and a flight instructor. In cross-country flights, fixed-wing and rotary wing aircraft are alike; the more sophisticated the type of aircraft the longer is the total trip distance it recorded. For all types of aircraft, only half of the available seats were occupied.

For local flights, as shown in Table 10A, the average load factor dropped slightly between 1981 and 1984 for most types of aircraft. The number of landings for each type of aircraft rose slightly from 1981 to 1984. This reversal brought the averages back to similar values found in 1978. The air traffic controllers strike in 1981 imposed a different set of constraints on all aircraft users.

For cross-country flights, as shown in Table 10B, the average load factor in 1984 has dropped back from the high levels in 1981 nearer to the levels of 1978. Average total trip distances for several types of aircraft also decreased. For example, the average trip distance for single-engine piston aircraft (4 places and over) dropped from 263.7 nautical miles in 1981 to 232.2 nautical miles in 1984. The average trip distance for turboprop aircraft did increase greatly, from 280.7 nautical miles in 1981 to 373.4 nautical miles in 1984; however, this 1984 value remains nearly one-third lower than the average of 497 nautical miles in 1978.

Nearly two-thirds (65.7 percent) of general aviation operations surveyed were cross-country flights, as shown in Table 11. This represents a shift from the 1981 and earlier surveys where less than 55 percent of all flights were cross-country.

TABLE 7

GENERAL AVIATION ACTIVE AIRCRAFT
FLEET BY AIRCRAFT TYPE

AIRCRAFT TYPE	PERCENTAGE DISTRIBUTIONS					
	SURVEYED AIRCRAFT			REGISTERED ACTIVE AIRCRAFT [1]		
	1978	1981	1984	1978	1981	1983
SINGLE ENGINE PISTON	80.4	82.1	78.5	80.8	78.8	78.0
MULTI-ENGINE PISTON	13.6	10.6	11.7	11.7	11.9	11.7
ROTORCRAFT	1.6	2.0	2.0	2.7	3.3	3.1
TURBOPROP	2.6	3.6	4.3	1.6	2.2	2.6
TURBOJET	1.5	1.0	2.2	1.2	1.5	1.8
OTHER AIRCRAFT	0.3	0.7	1.3	2.0	2.3	2.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

[1] "1983 General Aviation Activity and Avionics Survey," U.S. Department of Transportation, Federal Aviation Administration (Washington, D.C., 1984), P. 1-11.

TABLE 8

LOCAL FLIGHT CHARACTERISTICS BY AIRCRAFT TYPE

AIRCRAFT TYPE	AVERAGE CHARACTERISTICS					
	LANDINGS PER FLIGHT	FLIGHT TIME (MINUTES)	FLIGHT SPEED (KNOTS)	SEATS AVAILABLE	SEATS OCCUPIED	LOAD FACTOR
SINGLE-ENGINE PISTON (1-3 PLACES)	3.5	57.0	90.9	1.9	1.7	87.3
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	2.5	50.3	111.1	4.1	2.0	48.5
MULTI-ENGINE PISTON	2.8	42.2	146.3	5.5	2.3	43.6
ROTORCRAFT PISTON	4.3	53.3	79.8	3.4	1.7	57.2
ROTORCRAFT TURBINE	3.2	80.4	110.4	4.7	1.9	45.5
TURBOPROP	1.0	12.9	180.4	11.9	4.0	31.0
TURBOJET[1]	2.8	60.6	159.7	2.0	1.0	50.0
GLIDER	2.2	97.7	54.0	1.6	1.5	95.2

[1]Extremely low representation in survey sample

TABLE 9

CROSS-COUNTRY FLIGHT CHARACTERISTICS BY AIRCRAFT TYPE

AIRCRAFT TYPE	AVERAGE CHARACTERISTICS					
	LAST LEG DISTANCE (NAUTICAL MILES)	LAST LEG TIME (MINUTES)	TOTAL TRIP DISTANCE (NAUTICAL MILES)	SEATS AVAILABLE	SEATS OCCUPIED	LOAD FACTOR
SINGLE-ENGINE PISTON (1-3 PLACES)	123.8	68.6	191.6	2.0	1.5	76.0
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	157.2	82.2	232.2	4.5	2.3	51.5
MULTI-ENGINE PISTON	208.1	71.5	329.8	6.2	3.1	50.9
ROTORCRAFT PISTON	62.7	79.0	155.4	2.7	1.7	64.3
ROTORCRAFT TURBINE	121.1	66.5	175.5	6.1	3.0	50.4
TURBOPROP	260.5	70.6	373.4	10.5	5.8	52.4
TURBOJET	520.4	84.2	630.6	9.7	5.0	51.1
GLIDER	142.0	180.7	163.0	1.0	1.0	100.0

TABLE 10A

SELECTED LOCAL FLIGHT CHARACTERISTICS BY AIRCRAFT TYPE
1978-1984

AIRCRAFT TYPE	AVERAGE CHARACTERISTICS								
	LANDINGS PER FLIGHT			FLIGHT TIME (MINUTES)			LOAD FACTOR		
	1978	1981	1984	1978	1981	1984	1978	1981	1984
SINGLE ENGINE PISTON (1-3 PLACES)	3.5	2.6	3.5	63.0	54.8	57.0	82.7	82.8	87.3
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	2.5	2.2	2.5	58.0	54.5	50.3	50.5	53.4	48.9
MULTI-ENGINE PISTON	2.1	2.1	2.8	56.0	55.9	42.2	43.8	47.2	43.6
ROTORCRAFT PISTON	5.2	3.1	4.3	94.0	80.7	53.3	60.2	81.7	57.2
ROTORCRAFT TURBINE	3.4	1.9	3.2	92.0	73.9	80.4	36.0	60.2	45.5
TURBOPROP	2.2	1.1	1.0	35.0	35.5	12.9	40.7	29.8	31.0
TURBOJET[1]	5.8	1.0	2.8	71.0	6.0	60.6	31.1	10.0	50.0
GLIDER	3.5	1.4	2.2	67.0	55.7	97.7	97.2	100.0	95.2

[1]Extremely low representation in survey sample.

TABLE 10B

SELECTED CROSS-COUNTRY FLIGHT CHARACTERISTICS BY AIRCRAFT TYPE
1978-1984

AIRCRAFT TYPE	AVERAGE CHARACTERISTCS											
	LAST LEG DISTANCE (NAUTICAL MILES)			LAST LEG TIME (MINUTES)			TOTAL TRIP DISTANCE (NAUTICAL MILES)			LOAD FACTOR		
	1978	1981	1984	1978	1981	1984	1978	1981	1984	1978	1981	1984
SINGLE ENGINE PISTON (1-3 PLACES)	121	104	124	77	91	69	293	166.5	191.6	73.7	75.9	76.0
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	197	170	157	95	91	82	389	263.7	232.2	54.8	56.3	51.5
MULTI-ENGINE PISTON	223	205	208	77	93	72	455	328.2	329.8	55.7	55.7	50.9
ROTORCRAFT PISTON	125	60	63	78	37	79	188	561.6	155.4	51.8	93.3	64.3
ROTORCRAFT TURBINE	155	86	121	86	76	67	367	176.7	175.5	41.3	45.2	50.4
TURBOPROP	269	214	261	69	53	71	497	280.1	373.4	53.2	47.0	52.4
TURBOJET	541	498	520	77	82	84	851	697.6	630.6	57.8	62.2	51.1
GLIDER			142			201			163.0			100.0

TABLE 11

PERCENTAGE DISTRIBUTION OF TYPE OF FLIGHT BY AIRCRAFT TYPE

AIRCRAFT TYPE	TYPE OF FLIGHT	
	LOCAL	CROSS-COUNTRY
SINGLE-ENGINE PISTON (1-3 PLACES)	64.0	36.0
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	36.1	63.9
MULTI-ENGINE PISTON	7.9	92.1
ROTORCRAFT PISTON	69.6	30.4
ROTORCRAFT TURBINE	32.4	67.6
TURBOPROP	7.6	92.4
TURBOJET	3.4	96.6
GLIDER	94.2	5.8
TOTAL	34.3	65.7

Dramatic differences exist among types of aircraft used primarily for cross-country as opposed to local flying. Over 90 percent of the flights made in multi-engine piston, turboprop and turbojet aircraft are cross-country. Of the flights made in single-engine piston, rotorcraft piston and glider aircraft, more than 60 percent were local.

The relationships between several of pilot and flight characteristics are shown in Tables A-9 through A-12 in Appendix A. The examination of the relationship between flight characteristics and pilot certification shown in Table A-9 indicated that for local flights, students reported more landings per flight (3.8) and longer average flight times (55.9 minutes) than pilots with any other certificate type. Highest flight speeds were reported by private (106.2 nautical miles per hour or knots) and ATR pilots (104.2 knots). On cross-country flights, foreign and ATR pilots appear to have flown the most amount of miles per trip.

The local flight characteristics by pilot certificate appeared very similar to those reported in the 1981 survey. However, for all types of certificates, pilots appeared to have flown slightly slower in 1984; for example, commercial pilots averaged 95.0 knots in 1984 in comparison to 104.4 knots in 1981.

Cross-country flight characteristics by pilot certificate also appear similar to those in the 1981 survey. However, for some types of certificates, pilots appeared to have flown slightly shorter trips. Private pilots averaged 250 nautical miles for cross-country trips in 1981, while they averaged only 209 nautical miles for similar trips in 1984. Commercial pilots averaged 276 nautical miles in 1981 and only 263 nautical miles in 1984.

Average characteristics of flights varied to some degree in accordance with the purpose of the flight. For local flights as shown in Table A-11, business, executive/corporate and air taxi flights were flown at the highest rates of speed. Executive/corporate flights averaged 137 knots and business and air taxi flights averaged 120 knots. Aerial applications had the highest average number of landings per flight (4.8), while air taxi flights had the lowest (1.3). Industrial flights averaged the longest local flight times (91 minutes), while air taxi flights averaged the shortest times (35 minutes).

Cross-country flight characteristics according to the stated purpose of the flight are shown in Table A-12. Both business and executive/corporate flights averaged over 300 nautical miles in total length. In contrast, aerial application, cross-country flights averaged only 134 nautical miles.

C. UTILIZATION OF SERVICES PROVIDING PREFLIGHT AND INFLIGHT WEATHER INFORMATION

A significant portion of the pilot survey was devoted to the extent of use of preflight and inflight weather information. As numerous sources are available to pilots for obtaining weather information, the FAA was interested in discovering which sources of information are actually used.

Preflight weather information may be obtained from the FAA through Flight Service Station (FSS) briefings, Pilots Automatic Telephone Weather Answering Service (PATWAS), Transcribed Weather Broadcasts (TWEB), Voice Response System (VRS), and Airport Terminal Information Service (ATIS) broadcasts. Other sources of preflight weather information include the National Oceanographic and Atmospheric Administration (NOAA) broadcasts, National Weather Service (NWS) briefings, television, radio and newspaper reports.

FAA sources of inflight weather information include Enroute Flight Advisory Service (EFAS), Flight Watch, Airport Terminal Information Service (ATIS), FSS hourly broadcasts, TWEB broadcasts both NDB (non-directional beacon) and VOR (very high frequency in the directional range), and direct contact with FSS, Air Route Traffic Control Centers or control towers.

This portion of the survey results portray the extent to which FAA services were utilized according to type and purpose of flight. Tables 12 and 13 show the percentages of pilots who used FAA or other sources of preflight and inflight weather information by purpose of flight for local and cross-country flights separately.

Table 12 indicates that 32.9 percent of pilots of all local flights used one or more of the FAA sources of preflight weather information, 31.6 percent used some other sources of information, and 35.5 percent did not obtain any preflight weather information. More than 70 percent of pilots making commuter air carrier, air taxi and industrial flights used FAA sources of preflight information for their local flights. Nearly two-thirds of aerial application flight pilots obtained their preflight information from non-FAA sources. Pilots making local flights for personal purposes were least likely to obtain any preflight information; 39.0 percent of this group obtained no preflight weather information.

The table shows that pilots were much more likely to obtain preflight weather information for cross-country flights. Nearly 80 percent of pilots making cross-country flights obtained preflight weather information from at least one FAA source. Another 11.5 percent obtained such information from another source, leaving 8.7 percent to obtain no information at all. Over 50 percent of all pilots of each category of cross-country flights obtained preflight weather information from at least one FAA source.

TABLE 12

PERCENTAGE UTILIZATION OF PREFLIGHT WEATHER INFORMATION SERVICES BY TYPE AND PURPOSE OF FLIGHT

LOCAL: PREFLIGHT WEATHER INFORMATION			PURPOSE OF FLIGHT	CROSS-COUNTRY: PREFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
32.6	28.1	39.0	PERSONAL	70.9	13.6	15.1
41.6	24.1	34.2	BUSINESS	84.3	9.2	6.2
39.9	25.7	34.3	EXECUTIVE/CORPORATE	92.1	5.5	2.4
100.0	0.0	0.0	COMMUTER AIR CARRIER	50.7	31.6	17.7
73.0	18.2	3.8	AIR TAXI	85.2	10.1	4.7
10.5	64.9	24.5	AERIAL APPLICATION	80.2	19.8	0.0
73.8	20.4	5.7	INDUSTRIAL	61.8	28.7	9.4
31.5	28.1	40.4	OTHER	74.4	18.5	7.1
32.9	31.6	35.5	ALL FLIGHTS	79.8	11.5	8.7

TABLE 13

PERCENTAGE UTILIZATION OF INFLIGHT WEATHER INFORMATION SERVICES BY TYPE AND PURPOSE OF FLIGHT

LOCAL: INFLIGHT WEATHER INFORMATION			PURPOSE OF FLIGHT	CROSS-COUNTRY: INFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
12.6	16.4	70.9	PERSONAL	41.6	10.4	47.9
16.4	15.9	67.6	BUSINESS	40.3	18.8	40.9
0.0	0.0	100.0	EXECUTIVE/CORPORATE	36.2	13.3	50.6
54.1	0.0	45.9	COMMUTER AIR CARRIER	24.9	28.7	46.4
20.2	0.0	79.8	AIR TAXI	37.3	16.3	46.4
1.1	21.0	77.9	AERIAL APPLICATION	0.0	0.0	100.0
15.5	23.9	60.6	INDUSTRIAL	35.6	6.9	57.6
22.5	12.6	64.9	OTHER	23.0	7.7	69.2
12.2	19.5	68.3	ALL FLIGHTS	38.3	15.5	46.2

With respect to inflight weather information, the data in Table 13 show that only 12.2 percent of local flight pilots contacted any of the FAA weather sources. 68.3 percent of all pilots making local flights did not obtain any inflight weather information. Of the cross-country flight pilots, 38.3 percent obtained inflight information from one or more FAA source, 15.5 percent used some other source, while 46.2 percent did not ask for any weather information during their flight.

Utilization of preflight and inflight weather information by type of pilot certificate and aircraft are portrayed in Tables A-13 through A-16 of Appendix A. Table A-13 shows the utilization of preflight weather information by type of flight by type of aircraft. Nearly 50 percent of pilots of local flights on single-engine piston aircraft seating four or more people obtained preflight information from at least one FAA source. Over 30 percent of pilots of local flights on single-engine piston aircraft seating between one and three people obtained FAA preflight weather information.

Table A-14 shows the utilization of inflight weather information by type of flight by type of aircraft. Pilots of turboprops appear to have made the greatest use of FAA inflight weather information during local flights (80.1 percent). During cross-country flights, pilots flying multi-engine pistons took the greatest advantage of the FAA inflight weather information services (46.1 percent).

Pilot certificate category has also examined for the extent to which weather information services were utilized. Table A-15 shows the level of use of preflight weather services by type of flight (local or cross-country) by pilot certificate category. ATR pilots made the greatest use of the FAA services; they used at least one FAA service 46.6 percent of the time for local flights. In contrast, over 40 percent (41.0) of pilots with private certificates did not obtain any preflight weather information. Nearly 80 percent of all pilots obtained preflight weather information for cross-country flights; only 6.5 percent of ATR pilots failed to obtain any preflight weather information for cross-country flights.

Usage of inflight weather information services appears to have been far less than preflight services. Table A-16 shows the utilization of inflight weather information by type of flight by type of pilot certificate. For local flights, students used the FAA inflight services the least (8.8 percent). However, they did make the greatest amount of use of other sources (28.1 percent). ATR pilots made the most usage of FAA inflight weather information services (40.5 percent) for cross-country flights.

Pilot utilization of preflight and inflight weather information was compared to similar data for 1981. The comparison revealed that the use of FAA preflight weather information remained

the same, while the use of other weather information increased noticeably. The 1981 survey found that although 34.5 percent of local flights obtained preflight weather information from at least one FAA source, 50.4 percent of all local flights did not obtain any preflight weather information at all. In contrast, the 1984 survey shows that although only 32.9 percent of local flights obtained preflight information from an FAA source, only 35.5 percent failed to obtain any preflight weather information at all.

The same phenomenon appears to have held for inflight weather information services. The utilization of FAA inflight weather services declined between 1981 and 1984, while the usage of some form of inflight weather services increased. For local flights, the percentage using FAA inflight services dropped from 18.7 percent in 1981 to 12.2 percent in 1984, as the percentage using no services also fell from 77.2 percent in 1981 to 68.3 percent in 1984. For cross-country flights, the percentage using FAA inflight services dropped from 49.7 percent in 1981 to 38.3 percent in 1984, while the percentage using no services also fell from 48.1 percent in 1981 to 46.2 percent in 1984.

Overall utilization of preflight and inflight weather information is shown in Table 14A. The table shows that over 30 percent (30.8) of local flights did not utilize either preflight or inflight weather services. Of the local flight pilots who obtained weather information, 39.9 percent obtained it before departure. 41.4 percent of the cross-country pilots obtained preflight but no inflight weather information. Nearly 50 percent (49.6) of cross-country pilots used both services, while only 24.5 percent of local flight pilots did so.

Table 14B shows a comparison of the utilization of weather information by type of flight over the last three surveys. In general, the use of preflight but not inflight weather information has been increasing over this time period. For local flights, the usage of preflight but not inflight information has increased from 17.1 percent in 1978 to 32.1 percent in 1981 to 39.9 percent in 1984. For cross-country flights, the usage of preflight but not inflight weather has markedly increased from 11.6 percent in 1978 to 41.4 percent in 1984.

TABLE 14A

OVERALL PERCENTAGE UTILIZATION OF
PREFLIGHT AND INFLIGHT WEATHER
INFORMATION SERVICES BY TYPE OF FLIGHT

TYPE OF FLIGHT	WEATHER INFORMATION SERVICES UTILIZED			
	PREFLIGHT AND INFLIGHT	PREFLIGHT BUT NOT INFLIGHT	INFLIGHT BUT NOT PREFLIGHT	NEITHER PREFLIGHT NOR INFLIGHT
LOCAL	24.5	39.9	4.7	30.8
CROSS-COUNTRY	49.6	41.4	2.0	6.9

TABLE 14B

COMPARISON OF OVERALL UTILIZATION OF PREFLIGHT AND INFLIGHT WEATHER INFORMATION SERVICES BY TYPE OF FLIGHT - 1978-1984

TYPE OF FLIGHT	WEATHER INFORMATION SERVICES UTILIZED					
	PREFLIGHT AND INFLIGHT			NEITHER PREFLIGHT NOR INFLIGHT		
	1978	1981	1984	1978	1981	1984
LOCAL	75.9	18.1	24.5	5.5	43.7	30.8
CROSS-COUNTRY	86.8	50.9	49.6	1.0	9.3	6.9

TYPE OF FLIGHT	WEATHER INFORMATION SERVICES UTILIZED					
	PREFLIGHT BUT NOT INFLIGHT			INFLIGHT BUT NOT PREFLIGHT		
	1978	1981	1984	1978	1981	1984
LOCAL	17.1	32.0	39.9	1.5	6.1	4.7
CROSS-COUNTRY	11.6	36.8	41.4	0.6	3.0	2.0

D. AIRPORT FACILITY PREFERENCES

The survey asked the responding pilots for their opinions as to levels of airport facilities provided. The survey was conducted at public-use general aviation airports with a variety of services available at each specific one.

The pilots who took part in the survey were asked to rate the survey site airport, where they had just landed, in terms of its location, approach zone condition, runway length, runway condition, runway lighting and Fixed Base Operator (FBO) service. (The latter two only in cases where they were available at the airport in question.) Table 15 presents the responses. The surveyed pilots replied that most of these requirements were met very well at the survey site airport. Over three-quarters (75.5 percent) said that the location was more than just adequate, and nearly that many (72.6 percent) felt that the runway length was more than adequate as well.

The pilots were also asked to rate the airport facilities preferred at a destination airport. These facilities include a control tower, a runway over 5,000 feet, a paved runway, runway lighting, Very High Frequency in the Directional Range/Distance Measurement Equipment (VOR/DME) approach, Instrument Landing System/Microwave Landing System (ILS/MLS) approach and FBO service. The facilities most preferred were runway lighting (85.4 percent) and FBO service (84.2 percent). The facility least preferred by the respondents was a runway over 5,000 feet (50.0 percent).

TABLE 15

AIRPORT FACILITY PREFERENCES
AT SURVEY SITE AIRPORT

FACILITIES	VERY WELL	ADEQUATELY	POORLY
AIRPORT LOCATION	75.5	21.6	1.1
APPROACH ZONE CONDITION	67.2	27.5	2.9
RUNWAY LENGTH	72.6	22.6	2.2
RUNWAY CONDITION	69.2	24.9	3.3
RUNWAY LIGHTING[1]	62.1	21.6	3.2
FBO SERVICE[1]	58.2	23.6	5.6

[1]If available at this airport.

TABLE 16

AIRPORT FACILITY PREFERENCES
AT DESTINATION AIRPORT

FACILITIES	YES	DON'T CARE	NO
A CONTROL TOWER	58.0	30.8	7.2
RUNWAY OVER 5,000 FEET	50.0	38.4	6.4
PAVED RUNWAY	80.4	13.5	1.8
RUNWAY LIGHTING	85.4	8.9	1.2
VOR/DME APPROACH	65.6	23.0	3.4
ILS/MLS APPROACH	66.3	22.8	3.8
FBO SERVICE	84.2	9.4	1.1

E. ESTIMATES OF FUEL CONSUMPTION AND AIRCRAFT MILES FLOWN

Another objective of the data analysis was to estimate total fuel consumption and average miles flown in general aviation. An estimate of general aviation fuel consumption in 1984 is obtained using fuel consumption rates reported in the survey. The estimates are calculated by multiplying total hours flown by each aircraft type by the average amount of fuel consumed by each aircraft type. Data for total hours flown were obtained from the FAA General Aviation Activity and Avionics Survey of 1983.

The results of this estimation procedure are presented in Table 17. The table shows that an estimated 940.5 million gallons of fuel were consumed in 1984. Of this, 388.0 million gallons were aviation gasoline and 552.5 million gallons were jet fuel. These estimates illustrate the continuation of the decline in the use of aviation fuel over the last decade. In 1978, an estimated 1,066.5 million gallons of aviation fuel were consumed. In 1981, only an estimated 951.6 million gallons were consumed.

An estimate was also made of total aircraft miles flown in general aviation using a combination of survey data and data obtained from the FAA General Aviation Activity and Avionics Survey of 1983. The following methodology was employed to obtain an estimate of total aircraft miles flown in general aviation for 1984 by aircraft type:

1. Local versus cross-country breakdown of flights by aircraft type was obtained from Table 11. The percentages were used as proxies for percentages of hours flown in local or cross-country flights.

2. Total hours flown for each aircraft type were obtained from the 1983 General Aviation Activity and Avionics Survey. The hours were disaggregated into local or cross-country using the percentages from step 1.

3. Average local and cross-country speeds were obtained from survey data. The local speed was requested in the pilot questionnaire. Cross-country speed was calculated as average last leg distance divided by average last leg time for each aircraft type.

4. Average speed was multiplied by hours flown for each aircraft type for local and cross-country flights to obtain estimates of miles flown by aircraft type.

5. Estimates of total miles flown for both local and cross-country were obtained by summing the estimates over all aircraft types.

The results of these calculations are presented in Table 18.

TABLE 17

ESTIMATES OF FUEL CONSUMPTION FOR 1983

TYPE OF AIRCRAFT	AVERAGE FUEL CONSUMED (GALLONS PER HOUR)		AIRCRAFT HOURS FLOWN CY 1983 [1] (THOUSANDS)	TOTAL FUEL CONSUMED (MILLION GALLONS)	
	AVIATION GASOLINE	JET FUEL		AVIATION GASOLINE	JET FUEL
SINGLE-ENGINE PISTON (1-3 PLACES)	7.1		8,189	58.1	
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	10.5		14,959	157.1	
MULTI-ENGINE PISTON	28.8		5,752	165.7	
ROTORCRAFT PISTON	12.4		572	7.1	
ROTORCRAFT TURBINE		26.4	1,700		44.9
TURBOPROP		74.3	2,173		161.5
TURBOJET		234.8	1,474		346.1
TOTAL				388.0	552.5

[1] "1983 General Aviation Activity and Avionics Survey," U.S. Department of Transportation, Federal Aviation Administration (Washington, D.C., 1984), p. 1-10.

TABLE 18

ESTIMATES OF AIRCRAFT MILES FLOWN
BY AIRCRAFT TYPE FOR 1984

TYPE OF AIRCRAFT	LOCAL			CROSS-COUNTRY		
	HOURS FLOWN (THOUS.)	AVERAGE SPEED (KNOTS)	MILES FLOWN (MILLIONS)	HOURS FLOWN (THOUS.)	AVERAGE SPEED (KNOTS)	MILES FLOWN (MILLIONS)
SINGLE-ENGINE PISTON (1-3 PLACES)	5241	91	477	2948	126	371
SINGLE-ENGINE PISTON (4 PLACES AND OVER)	5400	111	599	9559	132	1264
MULTI-ENGINE PISTON	454	146	66	5298	208	1102
ROTORCRAFT PISTON	398	80	32	174	52	9
ROTORCRAFT TURBINE	551	110	61	1149	132	152
TURBOPROP	165	180	30	2008	253	508
TURBOJET	50	160	8	1424	438	624
OTHER	396	54	21	24	N/A	N/A
TOTAL			1294			4030

Total miles flown by general aviation were estimated to be 5,324 million miles. Local flight activity is estimated at 1,294 million miles in comparison with the estimate of 4,030 million miles for cross-country flight activities. These estimates show a decrease of more than 500 million miles in local flight between 1981 and 1984, which was almost compensated for by an increase of over 400 million miles in cross-country flight activities during the same time period. Total miles flown decreased slightly from the 1981 estimated level of 5,462 million miles.

F. ESTIMATES OF TOTAL 1984 GENERAL AVIATION OPERATIONS AND TRAFFIC PATTERNS BETWEEN AIRPORT TYPES

One of the major objectives of the survey was the estimation of the total number of general aviation operations occurring in 1984. An operation is defined as a take-off or landing. A touch-go is counted as two operations.

The data recorded on the Traffic Count forms were used to derive estimates of daily operations for each of the four airport types (described on page 2). An adjustment was made in the estimation process to account for the fact that the data were collected in the summer months and may be subject to a seasonal bias. The resultant seasonally adjusted estimates of average daily activities by airport type are contained in Table 19. Total 1984 operations for each class of airport were estimated by multiplying the daily averages by 366 and then by the number of airports in each class.

The average number of daily operations for towered airports was 283 while the average for non-towered airports was 58. The estimate of total general aviation operations at public-use airports amounted to 164.1 million.

Table 20 presents the distribution of flight purpose by type of operation. Over 90 percent of executive/corporate and air taxi flights were cross-country (94.7 and 97.2 percent, respectively). Business and commuter air carrier flights were also mostly cross-country (85.2 and 89.3 percent). In contrast, over three quarters of all instructional and aerial application flights were local (76.7 and 89.8 percent, respectively).

Traffic patterns between airports were also addressed. Table 21 shows the percentage distribution of cross-country flights grouped according to originating and destination airport type. The findings show that the greatest percentage of cross-country flights were from towered airports to other towered airports (61.1 percent). In general, the least percentage of flights originated at airports with no towers and unpaved runways.

TABLE 19

ESTIMATES OF TOTAL 1984 GENERAL AVIATION OPERATIONS
AT PUBLIC-USE AIRPORTS

TYPE OF AIRPORT	NUMBER OF PUBLIC-USE AIRPORTS	AVERAGE DAILY OPERATIONS [1]	1984 TOTAL OPERATIONS (MILLIONS)
TOWERED	461	283	47.9
NON-TOWERED	5479	58	116.2
PAVED AND LIGHTED RUNWAYS	3002	83	91.6
PAVED AND UNLIGHTED RUNWAYS	474	42	7.3
UNPAVED RUNWAYS	2003	23	17.3
TOTAL	5940	75	164.1

[1]Adjusted for nighttime activity.

TABLE 20

PERCENTAGE DISTRIBUTION OF TYPE OF OPERATION
BY FLIGHT PURPOSE
1984

PURPOSE OF FLIGHT	TYPE OF OPERATION	
	LOCAL	CROSS-COUNTRY
PERSONAL	39.5	60.4
BUSINESS	14.8	85.2
EXECUTIVE/CORPORATE	5.3	94.7
COMMUTER AIR CARRIER	10.7	89.3
AIR TAXI	2.8	97.2
INSTRUCTIONAL	76.7	23.3
AERIAL APPLI ATION	89.8	10.2
INDUSTRIAL	42.5	57.5
ALL OPERATIONS	34.3	65.7

TABLE 21

PERCENTAGE DISTRIBUTION OF CROSS-COUNTRY FLIGHT ORIGINATING AIRPORT TYPE BY DESTINATION AIRPORT TYPE

ORGINATING AIRPORT TYPE	DESTINATION AIRPORT TYPE		
	TOWERED	NON-TOWERED, PAVED RUNWAYS	NON-TOWERED, UNPAVED RUNWAYS
TOWERED	62.3	46.2	26.3
NON-TOWERED, PAVED RUNWAYS	33.4	49.2	59.8
NON-TOWERED, UNPAVED RUNWAYS	4.3	4.6	13.9

III. METHODOLOGY

A. SURVEY DESIGN

The purpose of the General Aviation Pilot and Aircraft Activity Survey is to increase FAA knowledge of the characteristics of general aviation activity and its impact on the national aviation system. The survey was accomplished by obtaining information on general aviation activities and pilot characteristics from a sample of airports. In addition, changes in general aviation activity were analyzed by comparing the results of this survey with those of previous surveys.

The survey was designed to be conducted in two parts. Part I consisted of interviewing a sample of general aviation pilots upon their arrival at selected airports. Part II consisted of direct observation of general aviation operations at each of the sampled airports.

Part I. Interview of General Aviation Pilots

General aviation pilots were interviewed on arrival at selected airports even if they had previously been interviewed at another airport. Approximately 4,097 pilots were approached with 3,361 agreeing to be interviewed. The survey questionnaire contained 21 questions. A copy of this pilot questionnaire is displayed in Appendix B. Interviews were conducted by members of the Civil Air Patrol (CAP). Completed pilot questionnaires were received from 196 of the 445 airports in the sample.

Interviewers were requested to keep a record of those pilots who refused to take part in the survey, since such information is essential for determining the validity of the survey data. Data from the questionnaires were used to develop the pilot and flight characteristics profiles.

Part II. Traffic Count

The sample size of airports was fixed by practical considerations to 445. The sample was a stratified random sample designed to provide proportional representation by region. Within each region, the airport sample was further stratified by airport type:

Type 1. Towered
Type 2. Non-towered, paved and lighted (with at least one paved runway)
Type 3. Non-towered, paved and unlighted (with at least one paved runway)
Type 4. Non-towered, unpaved

Responses were received from 201 airports out of a total sample of 445.

Table 22 presents the distribution of the sample airports along with the distribution of airports open to the public and the distribution of the active pilot population and sample pilot interviews by region. Table 23 gives the distribution of sample airports over airport type.

The Civil Air Patrol (CAP) was allowed to select the dates for collection at each airport provided that one day was a weekday and one day was a weekend day. The days selected were during the months of July, August, September and October. Survey procedures required that every incoming pilot be interviewed on the selected survey days, and every general aviation operation occurring between the hours of 0600-2100 be recorded. If the airport was not open the entire survey period, the survey was conducted during the hours of operation of the airport. This fact was reflected in the estimation of activity levels.

TABLE 22

PERCENTAGE DISTRIBUTION OF SAMPLE PILOTS AND AIRPORTS VS. POPULATION DISTRIBUTIONS BY FAA REGION

FAA REGION	[1] ACTIVE PILOT POPULATION	PILOT INTERVIEWS	[2] AIRPORTS OPEN TO PUBLIC	[3] SAMPLE AIRPORTS
ALASKAN	1.7	0.9	6.1	0.5
CENTRAL	5.7	10.1	10.1	10.8
EASTERN	13.1	21.3	10.6	16.3
GREAT LAKES	16.6	16.6	20.8	22.9
NEW ENGLAND	4.8	5.4	3.5	5.6
NORTHWEST MOUNTAIN	9.9	5.1	11.6	5.6
SOUTHERN	16.2	17.9	14.7	21.5
SOUTHWEST	13.5	7.9	15.0	10.7
WESTERN PACIFIC	18.5	14.8	7.6	6.1
TOTAL	100.0	100.0	100.0	100.0

[1] "1984 U.S. Civil Airmen Statistics," U.S. Department of Transportation, Federal Aviation Administration (Washington, D.C., 1985), p. 10.

[2] According to data extracted in 1984 from the Airport Master File, maintained by the National Flight Data Center of the FAA.

[3] Represents airports at which interviews were conducted.

TABLE 23

PERCENTAGE DISTRIBUTION OF SAMPLE AIRPORTS VS. AIRPORT POPULATION BY TYPE OF AIRPORT

TYPE OF AIRPORT	AIRPORTS OPEN TO PUBLIC[1]	SAMPLE AIRPORTS[2]
TOWERED	7.8	25.8
NON-TOWERED	92.2	74.2
PAVED, LIGHTED RUNWAYS	50.5	49.7
PAVED, UNLIGHTED RUNWAYS	8.0	4.1
UNPAVED RUNWAYS	33.7	20.4
TOTAL	100.0	100.0

[1]According to the Airport Master File which is maintained by FAA's National Flight Data Center.

[2]Represents airports at which traffic counts were conducted.

B. ESTIMATION FROM THE QUESTIONNAIRE DATA

The cross-tabulations produced from the interview data are descriptive findings. These data represent weighted totals from the pilot questionnaires. The data were weighed according to the total annual hours flown in 1983 as stated by the pilot. For cases where the pilot had not listed hours flown in 1983, the average of the entire sample was used as the weight. The purpose of the weight is to represent more precisely the active general aviation pilot population regardless of activity.

In all cases, the cross-tabulations were produced only from those records which contained responses to all relevant questions. Therefore, each table may be based upon a different set of interviews. Due to this reason and the use of the weighting factor, the tabular results are presented as percentages rather than frequencies.

C. ESTIMATION FROM THE TRAFFIC COUNT DATA

The traffic count data were used to estimate total general aviation operations occurring in 1984. The approach taken was to derive an estimate for each of the four airport types (see page 40) and to sum over airport types to determine an overall total. This approach grouped the airports together which were expected to be homogeneous with respect to their daily traffic volume, since the facilities available at an airport are indicative of the traffic there. It was for this reason that the airports were sampled according to their tower and runway attributes.

For each airport type, an average daily traffic estimate was derived. Daily traffic is defined as the number of takeoffs plus the number of landings. In order to arrive at a daily estimate, it was necessary to make an estimate for each hour between 0600 and 2100 and sum the hourly estimates. This step was necessary because the hours of operation differed from airport to airport, as did the hours of observation. Partial hour observations were accounted for in the estimation procedure. Survey interruption periods were recorded and were taken into account.

Because traffic volumes differ between weekdays and weekend days, estimation of daily traffic profiles was performed separately for the two cases. The hourly traffic estimates over all airports for weekdays and weekend days are provided in Tables 24 and 25. An average daily estimate was calculated by weighting the weekday average by five and the weekend average by two and then dividing the total by seven.

An adjustment was made to the airport type daily traffic estimates to account for night traffic occurring between the hours of 2100 and 0600 at lighted airports. The adjustments were expressed as percentages of the traffic estimated for the 0600 to 2100 interval. The adjustment factors used were seven percent

TABLE 24

SEASONALLY ADJUSTED WEEKDAY HOURLY GENERAL AVIATION TRAFFIC ESTIMATES

HOUR OF DAY	AIRPORT TYPE			
	TOWERED	NON-TOWERED		
		PAVED, LIGHTED RUNWAYS	PAVED, UNLIGHTED RUNWAYS	UNPAVED RUNWAYS
0600-0659	1.9	0.7	0.0	0.0
0700-0759	5.1	2.3	1.2	0.3
0800-0859	13.0	3.3	0.0	0.8
0900-0959	23.2	4.4	0.5	2.6
1000-1059	33.0	7.0	1.6	2.7
1100-1159	25.9	7.5	5.1	3.1
1200-1259	17.5	8.0	7.4	0.8
1300-1359	19.9	6.4	14.5	1.9
1400-1459	24.4	7.2	6.5	1.2
1500-1559	27.0	6.6	4.8	2.8
1600-1659	22.1	6.5	3.1	0.5
1700-1759	24.6	5.1	0.0	2.4
1800-1859	18.0	6.3	0.0	0.7
1900-1959	14.2	4.2	0.0	1.2
2000-2059	6.4	2.4	0.0	1.5
TOTAL	276.4	77.8	44.9	22.7

TABLE 25

SEASONALLY ADJUSTED WEEKEND DAY HOURLY
GENERAL AVIATION TRAFFIC ESTIMATES

	AIRPORT TYPE			
		NON-TOWERED		
HOUR OF DAY	TOWERED	PAVED LIGHTED RUNWAYS	PAVED UNLIGHTED RUNWAYS	UNPAVED RUNWAYS
0600-0659	0.8	0.1	0.0	0.0
0700-0759	5.7	1.1	0.0	0.8
0800-0859	12.9	2.6	0.0	1.7
0900-0959	21.3	6.1	0.3	1.8
1000-1059	28.5	9.0	2.8	1.6
1100-1159	26.0	10.7	4.8	3.2
1200-1259	24.7	10.9	6.0	2.4
1300-1359	26.0	8.5	4.3	2.2
1400-1459	22.8	10.2	6.0	3.8
1500-1559	19.7	11.1	6.5	2.1
1600-1659	15.1	6.7	4.5	1.4
1700-1759	12.7	4.7	0.4	2.1
1800-1859	11.1	3.4	0.1	1.9
1900-1959	6.2	2.3	0.0	0.9
2000-2059	3.2	1.2	0.0	0.0
TOTAL	236.8	98.6	35.6	25.7

and three percent of estimated daily traffic for type 1, towered airports and type 2, non-towered with paved and lighted runways, respectively. The resulting estimates are presented in Table 19.

Because general aviation activity is affected by the climate, a seasonal influence on the level of activity occurs at different times of the year, particularly in regions with more pronounced seasonal weather patterns. The survey data were collected during the summer months; yet an annual estimate is desired. Therefore, the seasonal bias had to be removed before the annual estimate could be made.

Historical data collected at FAA towered airports were used to calculate quarterly seasonal patterns for each FAA region through use of the Census X-11 seasonal adjustment program. The factors for the third quarter were applied to the individual airport traffic counts before the estimation was performed, yielding daily averages corrected for potential seasonal bias.

The following methodology was employed to estimate the total number of general aviation operations in 1984:

1. Apply seasonal factors to individual airport counts.

2. For each of the four airport types:

   a. Calculate an hourly average number of operations for each hour between 0600 and 2100, separately for weekdays and weekend days.

   b. Sum the hourly averages to obtain daily averages.

   c. Weight the weekday and weekend day daily average to obtain an overall daily average.

   d. Adjust the daily average to reflect nighttime activities.

   e. Multiply the adjusted daily estimate by 366 and then by the number of airports in each category, to obtain four annual estimates.

3. Sum the four annual estimates.

D. RELIABILITY OF THE SURVEY DATA

An assessment of the reliability of survey data is difficult to make under any circumstances. The quality of the data is dependent upon many factors, some of which are within the control of the survey practitioner and others which at best can be guarded against in an effort to control their impact.

Errors in survey data are of two types, sampling error and non-sampling error. Sampling error results from the fact that only a portion of the population under study has been observed rather than the entire population. This type of error manifests itself by the fact that each different sample which could potentially result from the sample design would yield a different estimate of the quantity being estimated. The degree to which these estimates vary over the different samples is referred to as the sampling error.

The magnitude of the sampling error is a function of the sample design and estimation techniques. A well designed sample which incorporates prior knowledge about the underlying population can greatly reduce sampling error. In the case of the 1984 survey, there were three underlying populations of interest: the active pilot population, the population of general aviation flights occurring in 1984, and the population of general aviation operations occurring in 1984. The sample design had to allow for estimation involving all three populations. The discussion concerning the sample design which was presented earlier describes how this goal was achieved. The final sample design was based upon extensive prior knowledge of the underlying population.

Non-sampling errors arise from a variety of sources and impact the estimate via biases which cause the mathematical expected value of the estimator to differ from the true population value. One such source is non-response. Units in the sample which do not respond bias the estimates produced from the sample to the extent that they represent a homogeneity with respect to the characteristic under study which is different from that represented by the respondents. Non-response bias can be somewhat corrected for by various methods which involve adjusting for the nonrespondents.

In this survey, non-respondents were represented by those pilots who refused to be interviewed. The extent of non-response differed from site to site, but an overall rate of approximately 18 percent was experienced. Because of the nature of the survey, there was no way to follow up these cases and no way to adjust for them. Hence, their impact on the results in indeterminable. However, comparisons to other sources of data on the populations suggest that their impact was minimal.

Another type of non-response experienced in the survey was non-response at the airport level. Although 445 airports were

selected into the sample, operations were surveyed at 201 of them. As a result, the geographical and airport type distribution of the sample was distorted. The effect that this had on the observed characteristics of pilots and flights cannot be determined, but again, the alternate sources suggest that the impact was not serious.

Another type of non-sampling error is measurement error. This type of error results from respondents providing incorrect data. Careful editing of the survey documents is one means of protecting against this type of error.

In addition to non-response and measurement error, which occur during the data collection process, other errors may be introduced during the data processing stage. These errors include coding, transcription and data entry errors, as well as judgmental errors in editing the data. Because of the numerous sources of non-sampling errors and the inability to assess the magnitude of the resultant biases, it is generally believed that they are a more dangerous type of error than the sampling error, which in most cases can be estimated using the data. The most effective means of dealing with non-sampling errors therefore is to anticipate them and thereby attempt to control them via quality control measures. In the data processing phase of the survey operations, many such quality control measures were applied to minimize the introduction of non-sampling errors into the survey data.

APPENDIX A

TABLE A-1

PERCENTAGE DISTRIBUTION OF PILOT CERTIFICATE
BY PILOT AGE

PILOT CERTIFICATE	PILOT AGE											
	UNDER 16[1]	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 AND OVER	ALL PILOTS
STUDENT	33.3	60.4	20.3	20.1	16.1	11.4	7.7	8.8	6.2	4.0	2.3	12.2
PRIVATE	50.0	37.7	30.8	35.7	42.2	41.6	43.7	50.3	49.0	58.6	49.8	43.6
COMMERCIAL	0.0	1.9	45.5	31.4	25.2	27.9	30.6	28.4	36.1	26.0	36.3	30.7
ATR	0.0	0.0	3.4	12.6	16.1	19.1	18.0	12.5	8.7	11.4	11.6	13.3
FOREIGN	16.7	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Extremely low representation in survey sample.

TABLE A-2

PERCENTAGE DISTRIBUTION OF SOURCE
OF AIRCRAFT BY PILOT AGE

SOURCE OF AIRCRAFT	PILOT AGE											
	UNDER 16[1]	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 AND OVER	ALL PILOTS
OWNER OR PARTNER	50.0	23.6	20.8	28.8	37.4	40.0	50.7	54.5	64.9	70.0	64.2	45.7
RENTAL, FLYING CLUB, LEASED	50.0	65.5	61.1	47.5	40.0	31.4	23.9	22.9	17.8	15.9	18.9	32.0
CORPORATE	0.0	0.0	9.4	14.3	15.7	21.5	19.1	19.1	15.3	11.9	15.4	16.0
GOVERNMENT	0.0	0.0	0.4	0.8	1.8	3.9	3.3	1.5	0.6	0.4	0.4	2.2
OTHER	0.0	10.9	8.3	8.6	5.1	3.2	3.0	2.0	1.4	1.8	1.1	4.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Extremely low representation in survey sample.

TABLE A-3

PERCENTAGE DISTRIBUTION OF SOURCE OF AIRCRAFT BY PILOT CERTIFICATE

SOURCE OF AIRCRAFT	PILOT CERTIFICATE				
	STUDENT	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	ALL CERTIFICATES
OWNER/PARTNER	17.2	63.5	32.7	21.8	77.8
RENTAL, FLYING CLUB, LEASED	74.8	23.4	30.0	17.9	0.0
CORPORATE	2.5	9.9	27.6	46.0	0.0
GOVERNMENT	0.0	0.6	3.7	5.6	22.2
OTHER	5.5	2.6	6.0	8.7	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0

TABLE A-4

PERCENTAGE UTILIZATION OF FLIGHT PLAN BY TYPE OF FLIGHT BY PURPOSE OF FLIGHT

LOCAL FLIGHT PLAN				PURPOSE OF FLIGHT	CROSS-COUNTRY FLIGHT PLAN			
NONE	IFR	VFR	[1] COMP		NONE	IFR	VFR	[1] COMP
91.2	1.1	6.6	1.1	PERSONAL	59.2	20.8	20.0	0.0
91.4	3.9	4.7	1.4	BUSINESS	43.3	44.6	11.3	0.9
69.9	22.2	7.9	0.0	EXECUTIVE/CORPORATE	24.7	72.9	2.4	0.0
54.1	0.0	45.9	0.0	COMMUTER AIR CARRIER	16.1	53.0	31.0	0.0
100.0	0.0	0.0	0.0	AIR TAXI	32.2	39.8	28.0	0.0
91.8	2.3	5.1	0.8	INSTRUCTIONAL	41.2	10.0	48.3	0.5
83.6	0.0	10.5	6.0	AERIAL APPLICATION	69.7	30.3	0.0	0.0
89.5	0.0	0.0	0.0	INDUSTRIAL	84.5	10.6	4.2	0.0
94.7	3.6	1.7	1.2	OTHER	58.1	28.2	13.7	0.0
91.1	2.3	5.5	1.0	ALL FLIGHTS	44.5	37.7	17.4	0.4

[1]Composite: Use of both IFR and VFR flight plans.

TABLE A-5

PERCENTAGE DISTRIBUTION OF FLIGHT PURPOSE BY SOURCE OF AIRCRAFT

PURPOSE OF FLIGHT	SOURCE OF AIRCRAFT					
	OWNER/ PARTNER	RENTAL, FLYING CLUB LEASED	CORPORATE	GOV'T	OTHER	ALL SOURCES
PERSONAL	55.3	23.1	7.4	1.9	8.9	29.2
BUSINESS	26.6	15.3	50.5	33.0	17.0	29.0
EXECUTIVE/CORPORATE	1.4	1.1	23.2	7.0	1.3	7.1
COMMUTER	0.1	1.5	2.6	0.0	12.7	1.9
AIR TAXI	13.1	35.9	24.0	0.4	22.7	7.8
INSTRUCTIONAL	8.3	44.4	1.6	8.5	16.6	17.6
AERIAL APPLICATION	0.5	0.4	1.5	3.5	1.0	0.8
INDUSTRIAL	1.4	0.5	2.4	19.5	0.6	1.8
OTHER	3.3	3.6	3.4	25.3	8.6	4.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

TABLE A-6

PERCENTAGE DISTRIBUTION OF SOURCE OF AIRCRAFT BY AIRCRAFT TYPE

SOURCE OF AIRCRAFT	AIRCRAFT TYPE								
	SINGLE ENGINE PISTON (1-3 PLACES)	SINGLE ENGINE PISTON (4 PLACES AND OVER)	MULTI-ENGINE PISTON	ROTOR-CRAFT PISTON	ROTOR-CRAFT TURBINE	TURBO-PROP	TURBO-JET	GLIDER	ALL AIRCRAFT TYPES
OWNER/PARTNER	36.3	49.9	25.2	50.2	5.2	9.9	11.2	44.9	36.1
RENTAL, FLYING CLUB, LEASED	48.6	30.9	16.8	22.6	12.7	9.7	10.0	53.8	29.4
CORPORATE	8.2	12.1	47.1	27.2	54.5	65.0	74.6	1.3	25.7
GOVERNMENT	0.4	3.3	2.6	0.0	12.5	4.5	2.6	0.0	2.7
OTHER	6.5	3.8	8.3	0.0	15.1	10.9	1.6	0.0	6.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE A-7

PERCENTAGE DISTRIBUTION OF FLIGHT PURPOSE BY AIRCRAFT TYPE

PURPOSE OF FLIGHT	AIRCRAFT TYPE								
	SINGLE ENGINE PISTON (1-3 PLACES)	SINGLE ENGINE PISTON (4 PLACES AND OVER)	MULTI-ENGINE PISTON	ROTOR-CRAFT PISTON	ROTOR-CRAFT TURBINE	TURBO PROP	TURBO-JET	GLIDER	ALL AIRCRAFT TYPES
PERSONAL	35.8	39.8	16.8	20.2	2.6	8.8	3.0	66.0	29.2
BUSINESS	13.3	27.9	43.6	25.8	34.7	38.3	52.3	0.0	29.0
EXECUTIVE/ CORPORATE	0.6	2.3	10.5	2.9	15.5	28.5	32.0	0.0	7.1
COMMUTER	0.4	0.2	4.1	0.0	0.0	10.8	2.7	0.0	1.9
AIR TAXI	0.8	5.4	19.2	0.0	23.1	8.5	7.4	0.0	7.8
INSTRUCTIONAL	40.3	16.7	2.8	33.1	0.0	0.0	1.9	29.8	17.6
AERIAL APPLICATION	2.6	0.2	0.1	3.7	2.9	0.0	0.0	0.0	0.8
INDUSTRIAL	1.2	3.1	0.5	6.0	5.6	0.7	0.0	0.0	1.8
OTHER	5.2	3.8	3.0	14.2	15.1	4.4	0.7	4.2	4.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE A-8

PERCENTAGE DISTRIBUTION OF SOURCE OF AIRCRAFT BY TYPE OF FLIGHT

SOURCE OF AIRCRAFT	TYPE OF FLIGHT	
	LOCAL	CROSS-COUNTRY
OWNER/PARTNER	36.7	35.7
COMMERCIAL	46.9	20.2
CORPORATE	10.2	33.8
GOVERNMENT	1.9	3.2
OTHER	4.3	7.1
TOTAL	100.0	100.0

TABLE A-9

LOCAL FLIGHT CHARACTERISTICS BY PILOT CERTIFICATE

PILOT CERTIFICATE	AVERAGE CHARACTERISTICS		
	LANDINGS PER FLIGHT	FLIGHT TIME (MINUTES)	FLIGHT SPEED (KNOTS)
STUDENT	3.8	55.9	81.6
PRIVATE	2.1	48.4	106.2
COMMERCIAL	3.1	53.9	95.0
ATR	2.4	41.1	104.2
FOREIGN	3.0	44.0	74.0

TABLE A-10

CROSS-COUNTRY FLIGHT CHARACTERISTICS BY PILOT CERTIFICATE

PILOT CERTIFICATE	AVERAGE CHARACTERISTICS		
	LAST LEG DISTANCE (NAUTICAL MILES)	LAST LEG TIME (MINUTES)	TOTAL TRIP DISTANCE (NAUTICAL MILES)
STUDENT	91.1	54.0	117.8
PRIVATE	161.2	79.6	209.3
COMMERCIAL	178.9	78.4	263.0
ATR	254.5	67.3	324.9
FOREIGN	81.3	55.1	1216.3

TABLE A-11

LOCAL FLIGHT CHARACTERISTICS BY PURPOSE OF FLIGHT

PURPOSE OF FLIGHT	AVERAGE CHARACTERISTICS		
	LANDINGS PER FLIGHT	FLIGHT TIME (MINUTES)	FLIGHT SPEED (KNOTS)
PERSONAL	2.4	46.9	106.3
BUSINESS	1.8	54.6	120.3
EXECUTIVE/CORPORATE	2.9	44.6	136.9
COMMUTER	2.5	39.7	100.0
AIR TAXI	1.3	35.1	120.4
INSTRUCTIONAL	3.9	57.9	93.2
AERIAL APPLICATION	4.8	78.8	96.4
INDUSTRIAL	1.4	91.4	95.0
OTHER	2.3	45.2	117.7

TABLE A-12

CROSS-COUNTRY FLIGHT CHARACTERISTICS BY PURPOSE OF FLIGHT

PURPOSE OF FLIGHT	AVERAGE CHARACTERISTICS		
	LAST LEG DISTANCE (NAUTICAL MILES)	LAST LEG TIME (MINUTES)	TOTAL TRIP DISTANCE (NAUTICAL MILES)
PERSONAL	190.2	84.3	294.1
BUSINESS	233.7	83.4	339.4
EXECUTIVE/CORPORATE	258.2	62.3	352.6
COMMUTER	130.1	52.4	189.3
AIR TAXI	141.3	53.7	216.3
INSTRUCTIONAL	103.5	59.2	145.1
AERIAL APPLICATION	134.4	105.5	134.4
INDUSTRIAL	150.9	96.9	177.3
OTHER	130.4	72.9	220.1

TABLE A-13

PERCENTAGE UTILIZATION OF PREFLIGHT WEATHER INFORMATION SERVICES BY TYPE OF FLIGHT BY TYPE OF AIRCRAFT

LOCAL: PREFLIGHT WEATHER INFORMATION			TYPE OF AIRCRAFT	CROSS-COUNTRY: PREFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
31.6	17.1	51.3	SINGLE-ENGINE PISTON (1-3 PLACES)	11.8	60.2	28.0
49.9	13.2	36.9	SINGLE-ENGINE PISTON (4 PLACES AND OVER)	37.5	14.9	47.6
5.9	89.6	4.5	MULTI-ENGINE PISTON	27.5	60.6	11.9
2.1	95.9	2.0	ROTORCRAFT PISTON	0.2	98.6	1.2
3.6	94.1	2.3	ROTORCRAFT TURBINE	2.7	92.0	5.3
4.1	95.9	0.0	TURBOPROP	12.4	82.2	5.4
1.0	97.7	1.3	TURBOJET	.6.9	93.1	0.0
1.5	98.5	0.0	GLIDER	0.0	99.5	0.5
32.9	31.6	35.5	ALL AIRCRAFT	79.8	11.5	8.7

TABLE A-14

PERCENTAGE UTILIZATION OF INFLIGHT WEATHER INFORMATION SERVICES BY TYPE OF FLIGHT BY TYPE OF AIRCRAFT

LOCAL: INFLIGHT WEATHER INFORMATION			TYPE OF AIRCRAFT	CROSS-COUNTRY: INFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
9.3	45.7	45.0	SINGLE-ENGINE PISTON (1-3 PLACES)	33.4	51.7	14.9
13.0	44.7	42.3	SINGLE-ENGINE PISTON (4 PLACES AND OVER)	39.0	20.2	40.8
18.9	77.2	3.9	MULTI-ENGINE PISTON	46.1	33.0	20.9
19.9	78.2	1.9	ROTORCRAFT PISTON	0.0	99.4	0.6
17.9	79.4	2.7	ROTORCRAFT TURBINE	16.0	80.3	3.7
26.6	71.3	2.1	TURBOPROP	32.0	55.5	12.5
80.1	19.8	0.1	TURBOJET	42.0	53.2	4.8
2.8	95.4	1.8	GLIDER	0.0	99.9	0.1
12.2	19.5	68.3	ALL AIRCRAFT	38.3	15.5	46.2

TABLE A-15

PERCENTAGE UTILIZATION OF PREFLIGHT WEATHER INFORMATION SERVICES BY TYPE OF FLIGHT BY PILOT CERTIFICATE

LOCAL: PREFLIGHT WEATHER INFORMATION			PILOT CERTIFICATE	CROSS-COUNTRY: PREFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
19.5	44.8	35.7	STUDENT	84.6	5.4	10.0
30.8	28.1	41.0	PRIVATE	71.7	13.0	14.3
36.8	29.4	33.5	COMMERCIAL	80.9	11.7	7.4
46.6	24.5	28.9	ATR	84.0	9.5	6.5
0.0	100.0	0.0	FOREIGN	0.0	92.1	7.9
32.9	31.6	35.5	ALL CERTIFICATES	79.8	11.5	8.7

TABLE A-16

PERCENTAGE UTILIZATION OF INFLIGHT WEATHER INFORMATION SERVICES BY TYPE OF FLIGHT BY PILOT CERTIFICATE

LOCAL: INFLIGHT WEATHER INFORMATION			PILOT CERTIFICATE	CROSS-COUNTRY: INFLIGHT WEATHER INFORMATION		
FAA	OTHER	NONE		FAA	OTHER	NONE
8.8	28.1	63.1	STUDENT	29.4	16.9	53.7
14.9	19.0	66.1	PRIVATE	39.0	12.3	48.7
12.1	17.0	70.9	COMMERCIAL	37.2	15.5	47.3
12.7	15.6	71.7	ATR	40.5	17.1	42.4
0.0	0.0	100.0	FOREIGN	0.0	92.4	7.6
12.2	19.5	68.3	ALL CERTIFICATES	38.3	15.5	46.2

APPENDIX B

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Form Approved
OMB No 2120-0097
Use Expires 5/1/87

GENERAL AVIATION PILOT AND AIRCRAFT ACTIVITY SURVEY

Pilot Questionnaire

This survey is authorized by sections 311 and 312 of the Federal Aviation Act of 1958, as amended. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely. Information collected in this survey will be used for statistical purposes only.

1. AIRPORT INFORMATION

   a. Airport name: _____

   b. Airport code *(FAA use only)*: _____

   c. Location *(nearest city)*: _____

   d. County: _____

   e. State: _____

   f. Airport tower: (1) _____ Tower (2) _____ No Tower

   g. Runway(s): a. (1) _____ Paved (2) _____ Unpaved
   b. (1) _____ Lights available (2) _____ No lights available

2. SURVEY DATE

   a. Day of week: _____

   b. Month/day/year: _____ / _____ / _____
   (mo / day / yr)

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INFORMATION FOR FLIGHT JUST COMPLETED

3. WHAT TYPE AIRCRAFT DID YOU USE IN THIS FLIGHT? *(Check only one)*

1. ☐ Single-engine piston
2. ☐ Multi-engine piston
3. ☐ Rotorcraft piston
4. ☐ Rotorcraft turbine
5. ☐ Turboprop
6. ☐ Turbojet
7. ☐ Glider
8. ☐ Balloon

4. HOW DID YOU OBTAIN THE AIRCRAFT FOR THIS FLIGHT? *(Check only one)*

1. ☐ Individual owner or partnership
2. ☐ Commercial rental or flying club or leased
3. ☐ Corporate owner other than commercial
4. ☐ Government
5. ☐ Other

5. HOW MANY SEATS ARE AVAILABLE FOR BOTH PASSENGERS AND CREW IN THIS AIRCRAFT? Number of Seats ☐

6. HOW MANY SEATS WERE OCCUPIED DURING THIS FLIGHT ? Number of Seats ☐

7. WHAT WAS THE MAIN PURPOSE OF THIS FLIGHT? *(Check only one)*

1. ☐ Personal
2. ☐ Business
3. ☐ Executive/corporate
4. ☐ Commuter air carrier
5. ☐ Air taxi *(excluding commuter air carrier)*
6. ☐ Instructional *(excluding proficiency)*
7. ☐ Aerial application
8. ☐ Industrial/special,patrol, survey, etc.
9. ☐ Other *(demonstration, R&D, parachuting, etc.)*

8. a. DID YOU OBTAIN WEATHER INFORMATION *PRIOR* TO THIS FLIGHT?

1. ☐ Yes
2. ☐ No *(If no, go to question 9)*

b. HOW DID YOU OBTAIN THE INFORMATION? *(Check all that apply)*

1. ☐ FSS briefing
2. ☐ NWS briefing
3. ☐ VRS briefing
4. ☐ TV/radio /newspaper
5. ☐ PATWAS/Tele TWEB
6. ☐ TWEB broadcast
7. ☐ NOAA broadcast
8. ☐ ATIS broadcast
9. ☐ Other sources

9. a. DID YOU OBTAIN WEATHER INFORMATION *DURING* THIS FLIGHT?

1. ☐ Yes
2. ☐ No *(If no, go to question 10)*

b. HOW DID YOU OBTAIN THIS INFORMATION? *(Check all that apply)*

1. ☐ Contacted EFAS (FLIGHT WATCH)
2. ☐ Monitored FLIGHT WATCH
3. ☐ Contacted FSS other than FLIGHT WATCH
4. ☐ Contacted center/tower
5. ☐ ATIS broadcast
6. ☐ FSS hourly broadcast
7. ☐ TWEB-NDB broadcast
8. ☐ TWEB-VOR broadcast
9. ☐ Other

10.a. DID YOU FILE A FLIGHT PLAN FOR THIS FLIGHT?

1. ☐ Yes
2. ☐ No *(If no, go to question 11)*

b. WHAT TYPE OF FLIGHT PLAN DID YOU FILE? *(Check only one)*

1. ☐ Preflight IFR
2. ☐ Preflight VFR
3. ☐ Inflight IFR
4. ☐ Inflight VFR
5. ☐ Composite

c. HOW DID YOU FILE THE FLIGHT PLAN? *(Check only one)*

1. ☐ FSS tape-recorder (Fast File)
2. ☐ FSS specialist
3. ☐ Center/tower controller

11. WAS THIS FLIGHT LOCAL OR CROSS-COUNTRY?

1. ☐ Local, i.e., entire flight within 20 miles of this airport *(If local, go to question 12)*
2. ☐ Cross-country *(If cross-country, go to question 13)*

12. IF THIS WAS A LOCAL FLIGHT, *(Answer all)*

1. How many landings, including touch-and-go's, did you make?
2. What was the total flight time? (Hours Minutes)
3. What was the average air speed? (Knots)

13. IF THIS WAS A CROSS-COUNTRY FLIGHT, *(Answer all)*

1. What was your total enroute distance between the last departure and arrival airports? (Nautical Miles)
2. What was the flight time between the last departure and arrival airports? (Hours Minutes)
3. What type was the last airport you came from? *(Check only one)*

1. ☐ Towered 2. ☐ Non-towered, paved runway 3. ☐ Non-towered, unpaved runway

4. Counting all intermediate stops, what was your total enroute distance between origin and destination airports? (Nautical Miles)
5. What was the maximum enroute altitude during this flight? (MSL)

14. WHAT IS THE AVERAGE FUEL CONSUMPTION AT NORMAL CRUISE SPEED FOR THIS AIRCRAFT? (Gallons per Hour)

15. DO YOU HOLD A CURRENT INSTRUMENT RATING?

1. ☐ Yes 2. ☐ No

16. WHAT PILOT CERTIFICATE DO YOU CURRENTLY HOLD? *(Check only one)*

1. ☐ Student
2. ☐ Private
3. ☐ Commercial
4. ☐ Airline Transport
5. ☐ Foreign

17. WHAT IS YOUR AGE GROUP?

1. ☐ Less than 16
2. ☐ 16-19
3. ☐ 20-24
4. ☐ 25-29
5. ☐ 30-34
6. ☐ 35-39
7. ☐ 40-44
8. ☐ 45-49
9. ☐ 50-54
10. ☐ 55-59
11. ☐ 60 or over

18.a. DID YOU FLY IN 1983?

1. ☐ Yes 2. ☐ No *(If no, go to question 19)*

b. OF YOUR TOTAL FLYING TIME IN 1983, *(Answer both)*

1. How many hours were local flying?
2. How many hours were cross-country flying?

19. WERE YOU PREVIOUSLY ASKED TO COMPLETE THIS QUESTIONNAIRE AT THIS OR ANOTHER AIRPORT?

1. ☐ Yes 2. ☐ No

20. How well does this airport meet your requirements? *(Check all)*

	Very well	Adequately	Poorly
Airport location	☐	☐	☐
Approach zone condition	☐	☐	☐
Runway length	☐	☐	☐
Runway condition	☐	☐	☐
Runway lighting (if runway is lighted)	☐	☐	☐
FBO service (if there is FBO service)	☐	☐	☐

21. Do you prefer that the destination airport in your cross-country flight have the following facilities? *(Check all)*

	Yes	Don't care	No
A control tower	☐	☐	☐
Runway over 5,000 feet	☐	☐	☐
Paved runway	☐	☐	☐
Runway lighting	☐	☐	☐
VOR/DME approach	☐	☐	☐
ILS/MLS approach	☐	☐	☐
FBO service	☐	☐	☐

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Form Approved
OMB No 2120-0097
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GENERAL AVIATION PILOT AND AIRCRAFT ACTIVITY SURVEY

Traffic Count Form

1 Airport name: _____

2 Airport code (*FAA use only*): _____

3 Location (*nearest city*): _____ County: _____ State: _____

4 Airport tower: (1) _____ Tower (2) _____ No Tower

5 Runway(s): a (1) _____ Paved (2) _____ Unpaved

b (1) _____ Lights available (2) _____ No lights available

6 Time period(s) of survey interruption(s): _____

7 _____ _____
Day of the Week

8 Date: _____
(mo/day/yr)

9	10	11	12	13	14	15
Time (local)[a]	Aircraft Type[b]	Take-off	Land-ing	Touch/ Go	VFR	IFR

9	10	11	12	13	14	15
Time (local)[a]	Aircraft Type[b]	Take-off	Land-ing	Touch/ Go	VFR	IFR

[a] Use 24 hour clock and record time to the nearest minute e.g. 2:13 p.m. = 14:13

[b] 1 = Single-engine piston 1-3 places
2 = Single-engine piston 4 places & over
3 = Multi-engine piston
4 = Turboprop
5 = Turbojet
6 = Rotorcraft
7 = Glider
8 = Balloon

FAA FORM 1800-0T (4/84)

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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GENERAL AVIATION PILOT AND AIRCRAFT ACTIVITY SURVEY

Daily Summaries

1. Airport name: _____

2. Survey dates: _____ _____
(day of the week) (mo/day/yr) *(day of the week) (mo/day/yr)*

	First Day	Second Day
3. Time survey started:		
4. Time survey ended:		
5. Number of completed pilot questionnaires:		
6. Time period(s) of pilot survey interruption(s):		
7. Number of pilots who refused to cooperate:		
8. Number of completed traffic count forms:		
9. Time period(s) of traffic count interruption(s):		

10. Survey comments, if any: _____

_____

_____

11. Rank and name of Survey Team Leader: _____

Address:

Street _____

City, State, Zip _____

Telephone Numbers:
(include Area Code)

Home _____ _____

Office _____

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